United States Patent [19]

Dunbar

[11] **Patent Number: 4,694,877**

[45] **Date of Patent: Sep. 22, 1987**

[54] **MANUALLY OPERATED SHADE LOWERING AND RAISING MECHANISM FOR ATRIUM WALLS**

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[73] Assignee: **Inside Outfitters, Inc.**, Columbus, Ohio

[21] Appl. No.: **887,485**

[22] Filed: **Jul. 21, 1986**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 752,284, Jul. 5, 1985, abandoned.

[51] **Int. Cl.**[4] **E06B 9/204**; E06B 9/322

[52] **U.S. Cl.** ..... **160/273 R**; 160/84 R

[58] **Field of Search** ..... 160/339 U, 84 R P; 47/17 D, 17 A, 17 T, 17 E

[56] **References Cited**

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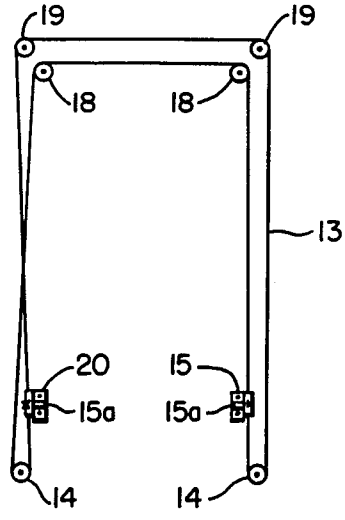
Primary Examiner—Ramon S. Britts
Assistant Examiner—Cherney S. Lieberman
Attorney, Agent, or Firm—John L. Gray

[57] **ABSTRACT**

A manually operated device for raising and lowering shades on glass-enclosed atrium or greenhouse walls which includes a self-leveling feature which corrects for uneven shade position and enables one to operate a shade on an atrium or greenhouse wall without the use of a motor-driven system.

Also disclosed is a manually operated device for raising and lowering shades on glass-enclosed atrium or greenhouse walls which may be raised or lowered with one hand grasping a handhold on either side of the shade, making it unnecessary to use both handholds.

6 Claims, 9 Drawing Figures



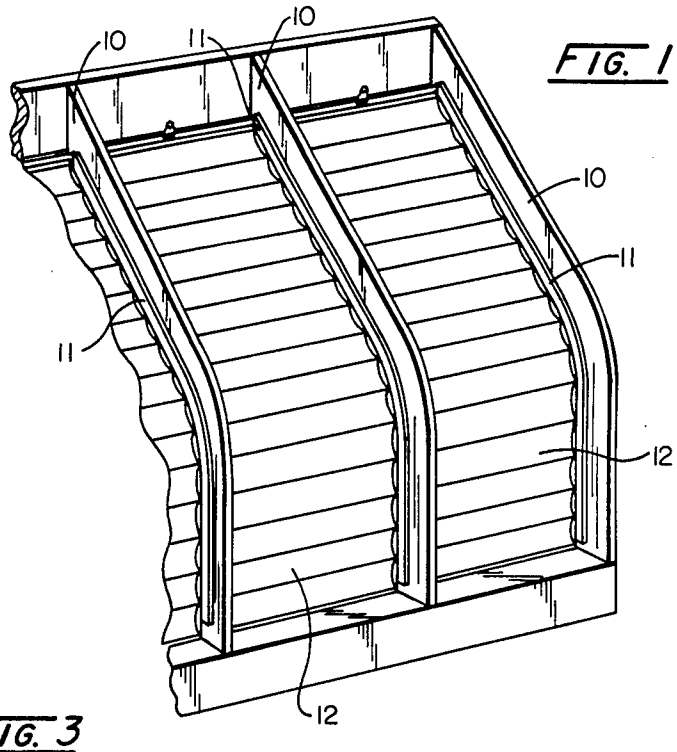
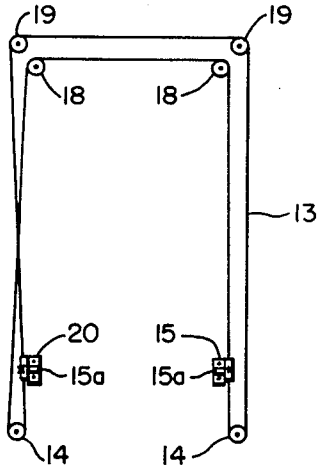


FIG. 1

FIG. 3



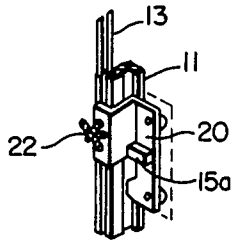


FIG. 4

FIG. 2

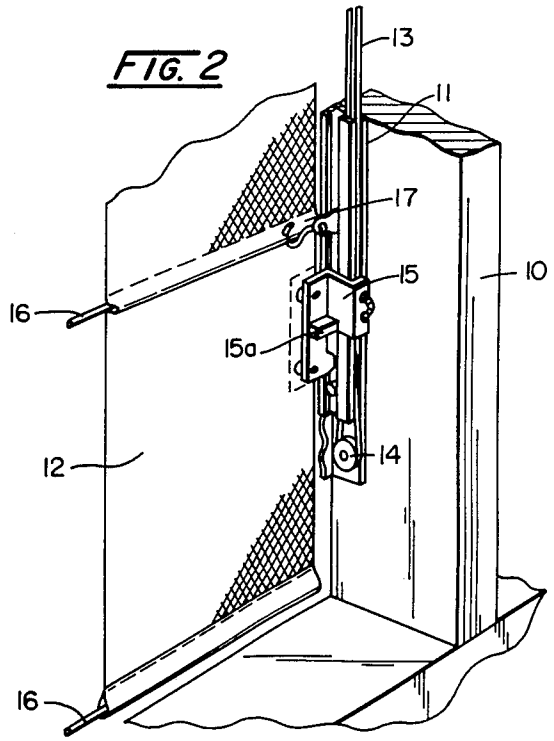
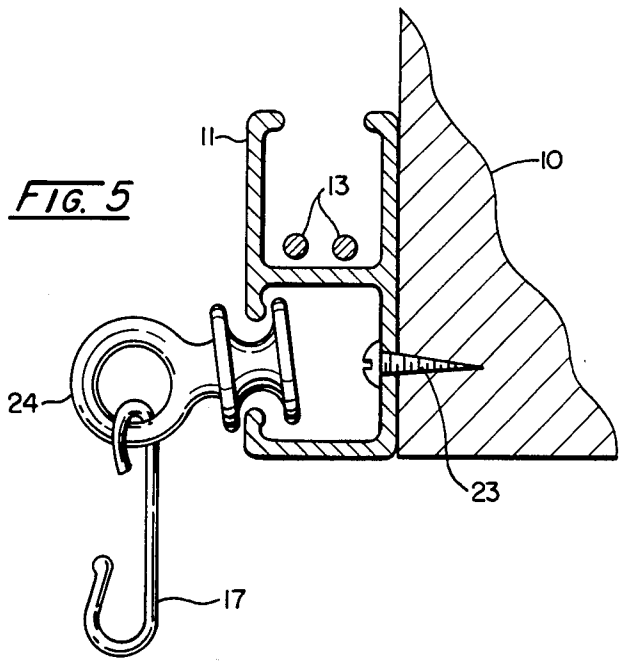


FIG. 5



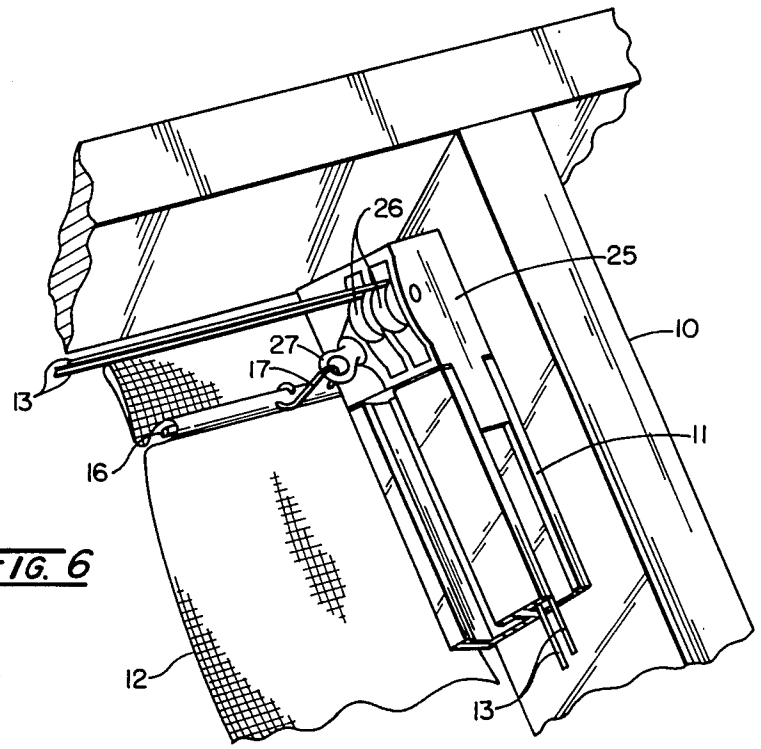


FIG. 6

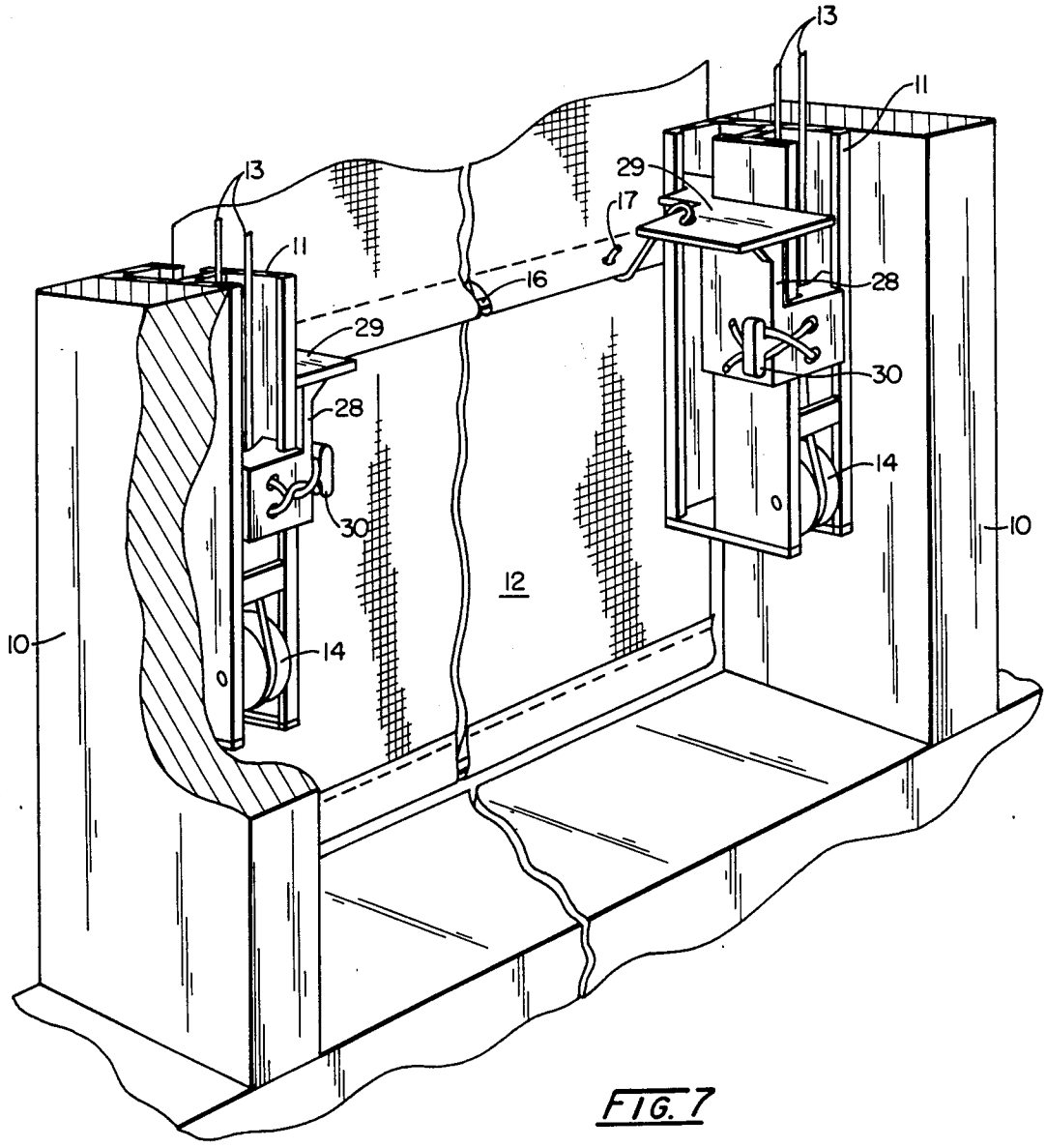


FIG. 7

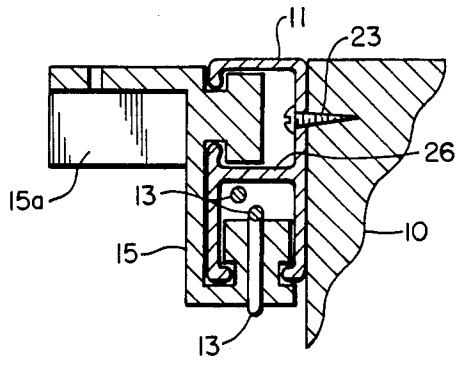


FIG. 8

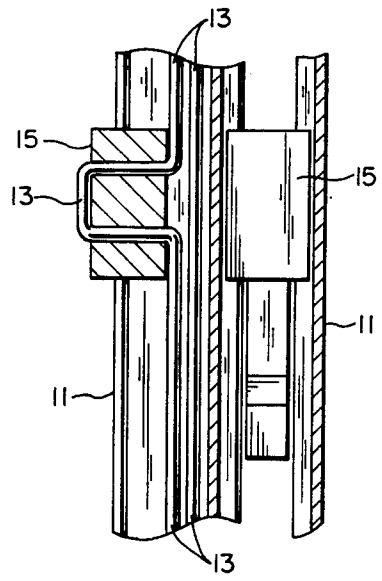


FIG. 9

MANUALLY OPERATED SHADE LOWERING AND RAISING MECHANISM FOR ATRIUM WALLS

This is a continuation-in-part application of U.S. patent application Ser. No. 752,284 filed on July 5, 1985, now abandoned.

BACKGROUND OF THE INVENTION

Glass-enclosed atrium or greenhouse structures are being used with greater frequency in restaurants and commercial buildings as well as homes. While these structures have many aesthetic advantages and are pleasing architecturally, in direct sunlight they become practically uninhabitable with severe discomfort on the part of the occupants. Consequently, it is necessary to provide some sort of a shading device which may readily be raised or lowered. Because these structures typically involve a vertical wall of glass which, at its topmost portion is curved to a 45° angle with the upper portion extending at such an angle until it joins the conventional portion of the structure, ordinary shades or blinds will not function because they would hang in an unattractive, ineffective fashion because of the overhanging curved portion of the atrium.

Therefore, it is necessary to provide tracks on which the shades can be supported and, as a consequence, these atriums or greenhouses are usually constructed in sections with tracks spaced two or three feet apart. The shades are thus supported on transversely extending rods that ride in said tracks and the shades are usually permitted to descend by gravity and may be raised by hand or by means of a motorized device. In any case, the shades occasionally will stick in one or the other tracks so that the shades will be askew and cause an unattractive appearance. This can occur either when the shade is raised or when it is lowered.

Power driven devices are available to raise or lower the shades, but these are relatively expensive and in many applications, especially where the atrium or greenhouse is small, it is desirable to have the shades operated manually. The only device of the prior art with which applicant is familiar is U.S. Pat. No. 2,229,898, Pastva, which is an awkward device to use for raising or lowering blinds in these circumstances and involves separate pulls which would not function in the overhanging atrium or greenhouse configuration. Furthermore, this system does not permit self-leveling of the blinds in case they become stuck while being raised or lowered.

SUMMARY OF THE INVENTION

The subject invention is a manually operated device for raising or lowering shades on a glass-enclosed atrium or greenhouse wall which includes a self-leveling feature so that if a shade should get hung up at the bend portion of the atrium or greenhouse wall where the vertical portion joins the sloping portion or elsewhere, the device selfadjusts so that the shades will hang level in the raised or lowered position. The subject invention is susceptible of being operated in a multiple number of glass-enclosed atrium or greenhouse wall sections and is particularly useful in relatively small atrium or greenhouse wall installations.

The subject invention also contemplates a manually operated device for raising and lowering shades in a glass-enclosed atrium or greenhouse wall wherein the shade may be raised or lowered by grasping a single handhold on either side of the shade so the shade may be raised or lowered with one hand.

It is therefore an object of this invention to provide a device to raise and lower shades on an atrium or greenhouse wall.

It is a further object of this invention to provide such a device which will permit the shades to be self-leveling in their open or closed position.

It is a still further object of this invention to provide such a device which may be operated manually.

It is a still further object of this invention to provide such a device which may be operated by one hand.

Additional objects and advantages of the present invention will become more readily apparent to those skilled in the art when the following general statements and descriptions are read in the light of the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a section of typical glass-enclosed atrium or greenhouse showing applicant's invention with the shades on the atrium wall in a closed position.

FIG. **2** is a perspective view of a corner section of the atrium or greenhouse wall showing applicant's invention as applied to a lower portion of the atrium wall showing the attachment to one side of the shade.

FIG. **3** is a schematic view of applicant's invention showing the relationship of the pulley and cords therein.

FIG. **4** is a detailed view of the portion of applicant's invention which is fixedly attached to the lower shade member on the opposite side from that shown in FIG. **2**.

FIG. **5** is a cross-sectional view of the compartmentalized track portion of applicant's invention.

FIG. **6** is a perspective view showing the manner in which applicant's invention is attached to the upper portion of the atrium or greenhouse wall.

FIG. **7** is a perspective view of a variation of applicant's invention which permits the shade to be raised by one hand showing the lower portion of the shade supporting mechanism.

FIG. **8** is a section through member **15** of FIG. **2**.

FIG. **9** is a side sectional view of member **15** shown in FIG. **8**.

DETAILED DESCRIPTION OF THE INVENTION

Referring now more particularly to FIG. **1**, the atrium or greenhouse wall is shown having mullions **10—10** provided with tracks **11—11** attached thereto. Shades **12—12** are shown in closed position.

Referring now more particularly to FIG. **2**, mullion **10** and shade **12** are shown with shade **12** in closed position and with track **11** housing, in one portion, cord **13** which extends around lower pulley **14** and passes through and is slideably positioned in member **15**, which is attached to shade **12**, and slides in compartmentalized track **11**, but may be adjusted upwardly or downwardly by means of handles **15***a*—**15***a* because cord **13** is slideably positioned in member **15**. Shade **12** is supported by rods **16—16** which in turn may be attached to hooks **17—17** which in turn slide in compartmentalized track **11**. Rods **16—16** support the shades when the shades are in a semi-horizontal position.

Referring now more particularly to FIG. **3**, cord **13** is shown passing over lower pulleys **14—14** on either side

of an atrium or greenhouse window segment and around pulleys **18—18** and **19—19**. It will be noted that cord **13** is fixedly secured to member **20** which in turn is secured to shade **12**. It is important that cord **13** traverse pulley **14** in a different direction on one side of the shade than it does on the other side of the shade. Thus when an individual uses handles **15*a*—15*a*** to grasp members **15** and **20** to raise or lower the shade **12**, upward movement of member **20** will result in corresponding upward movement of member **15** and corresponding upward movement of shade **12**, and if the shades become uneven since member **15** slidabely engages cord **13**, the horizontal alignment may be readily adjusted.

Referring now more particularly to FIG. **4**, member **20** is shown positioned in compartmentalized track **11**, and cord **13** may be tied as at **22** to effectively make it an endless cord that also fixedly attaches cord **13** to member **20**. Likewise, in operation if it is desired to lower shade **12**, it is merely necessary to grasp handholds **15*a*—15*a*** and pull down on them, remembering that the hand hold on member **15** may be raised or lowered if the device is uneven.

Referring now more particularly to FIG. **5**, compartmentalized track **11** is shown in cross section attached to the mullion **10** as by means of screw **23**. Cords **13—13** are shown in one section of the compartmentalized track **11** with hook **17** attached to bracket **24** which rides in the other channel of track **11**, the two compartments of the tracks being separate by a common wall **26**.

Referring now more particularly to FIG. **6**, the manner in which applicant's invention is attached to the upper portion of the atrium or greenhouse wall is shown. Mullion **10** has bracket **25** attached thereto which in turn engages compartmentalized track **11**, one channel of which houses cord **13—13**. Bracket **25** is equipped with pulleys **18** and **19** over which cords **13—13** pass to a comparable fixture on the other side of the window in that portion of the atrium or greenhouse wall. The shade **12** is supported at its upper portion by rod **16** which in turn is connected to hook **17** attached to hook holder **27** which is in turn attached to bracket **25**.

Referring now more particularly to FIG. **7**, mullions **10—10** on either side of the atrium or greenhouse window are provided with compartmentalized tracks **11—11**, one channel of which holds cords **13—13**, in turn engaging pulleys **14—14** attached to the lower ends of compartmentalized tracks **11—11**. Sliding in tracks **11—11** are carriers **28—28** in each track provided with combination handholds **29—29** which also engage hook **17** which in turn engages rod **16** attached to screen **12**. Carriers **28—28** are provided with T-shaped fittings **30—30** extending at right angles therefrom to which cords **13—13** may be attached.

Referring now more particularly to FIGS. **8** and **9**, it will be seen that member **15** slides in the two compartments of track **11** with the cords **13—13** passing through one compartment and through member **15** as shown in FIG. **9**. In the position shown in FIG. **9**, the member **15** may be raised or lowered if the device is uneven. The cord **13** in member **15** may also be tied off similar to the cord **22** in member **20**, if desired.

In installing the unit, the unit is leveled and the endless portion of cords **13—13** is twisted and wrapped around the T-shaped fittings **30—30** as shown in the left hand portion of FIG. **7**. The two open ends of cords **13—13** in the right hand portion of FIG. **7** are then twisted around the T-shaped fittings **30—30** and tied. In operation either of the handholds **29—29** on the left hand side or the right hand side may be raised or lowered and it will in turn cause the carriers **28—28** to be raised or lowered accordingly thus maintaining the shade in a level position even when going through the curved portion of an atrium or greenhouse wall.

Thus it will be seen that the invention discloses a manually operated device for raising or lowering shades on an atrium or greenhouse wall permitting the shade to be leveled as it is being raised or lowered, and also, in one version of the invention, permitting the shade to be raised or lowered using only one hand.

While this invention has been described in its preferred embodiment, it is to be appreciated that variations therefrom may be made without departing from the scope and spirit of the invention.

What is claimed is:

1. A device for manually raising and lowering a shade on a wall having a vertical portion connected to a concave portion which in turn is connected to a portion approaching the horizontal, said wall being provided with at least one window extending from the vertical portion through the concave portion and into the portions approaching the horizontal, said window being provided with mullions extending throughout the length of said window on either side thereof, at least a portion of said shade being positioned adjacent both said concave portion of said wall and said portion of said wall approaching the horizontal, said device comprising:

at least one oppositely disposed, vertically extending pair of compartmentalized parallel tracks comprising a first and second track attached to said wall, the side of said mullions adjacent said window and of a shape to conform to the contour of said wall,

said compartmentalized track having a U-shaped cord guiding portion, the opening of which extends toward said windows and a U-shaped shade supporting portion, the opening of which faces the edge of said shade, and a common wall forming the base of said cord guiding portion and a side of said shade supporting portion,

a plurality of shade supports positioned in said shade supporting portion of each of said tracks,

a shade positioned between said pair of tracks and connected to said shade supports,

said cord guiding portion of each said tracks being provided with means to prevent said cords from touching said shade and from sagging when said cords are in the concave position or in the position approaching the horizontal of said cord guiding portion of each of said tracks,

a first pulley and a second pulley positioned at the upper end of each of said tracks,

a third pulley positioned at the lower end of each of said tracks,

an endless cord positioned in the cord guiding portion of each of said tracks, said cord being positioned on said pulleys so that it engages said third pulley on said first track, then said second pulley on said first track, then said second pulley on said second track, then said third pulley on said second track in a reverse direction, then said first pulley on said second track, then said first pulley on said first track, then returning to said third pulley on said first track,

first means for securing one side of the lower portion of said shade to be raised or lowered by said device

to said cord between said third pulley and said first pulley on said first track, wherein said means comprises a base portion permanently secured to a lower portion of the shade and an extension to which the cords are secured and which rides in the cord guiding portion of said track wherein said shade may be raised or lowered by manual movement of said first and a second means,

said second means for fixedly securing the other side of said lower portion of said shade to be raised or lowered by said device to said cord between said third pulley and said second pulley on said second track, wherein said means comprises a base portion permanently secured to a lower portion of the shade and an extension to which the cords are secured and which rides in the cord guiding portion of said track wherein said shade may be raised or lowered by manual movement of said first and second means.

2. The device of claim 1 wherein said first means for securing one side of the lower portion of said shade includes means for fixedly securing said one side of the lower portion of said shade.

3. The device of claim 1 wherein said wall encloses an atrium or greenhouse and is provided with mullions and said parallel tracks are attached to said mullions.

4. The device of claim 1 wherein said shade is provided with spaced horizontally extending rods and a plurality of sliding members engaging the lower shade supporting portion of said tracks adapted to be attached to said rods.

5. The device of claim 1 wherein said means for fixedly securing said cord to the lower portion of the shade to be raised or lowered by said device is adapted to slide in the upper cord guiding portion of said track.

6. The device of claim 1 wherein said endless cord is formed by securing opposite ends of a cord to said means for fixedly securing the other side of said lower portion of said shade to be raised or lowered by said device to said cord.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,694,877

DATED : September 22, 1987

INVENTOR(S) : Donn D. Dunbar

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the first page at [54] in the third line of the title insert the words "or greenhouse" after the word "atrium".

In column 1 of the specification in the third line of the title insert the words "or greenhouse" after the word "atrium".

Signed and Sealed this

Nineteenth Day of January, 1988

Attest:

Attesting Officer

DONALD J. QUIGG

Commissioner of Patents and Trademarks